



Sideband and Frequency Modulation Formulas

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Examples!

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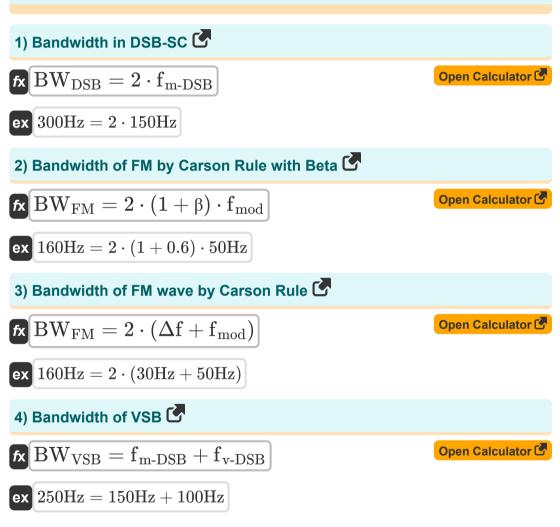
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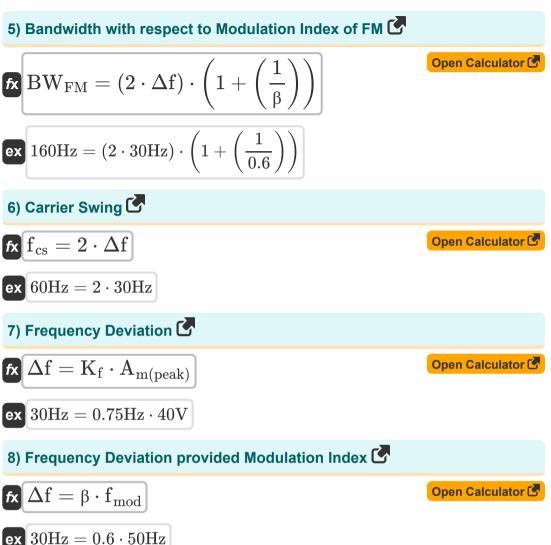


List of 21 Sideband and Frequency Modulation Formulas

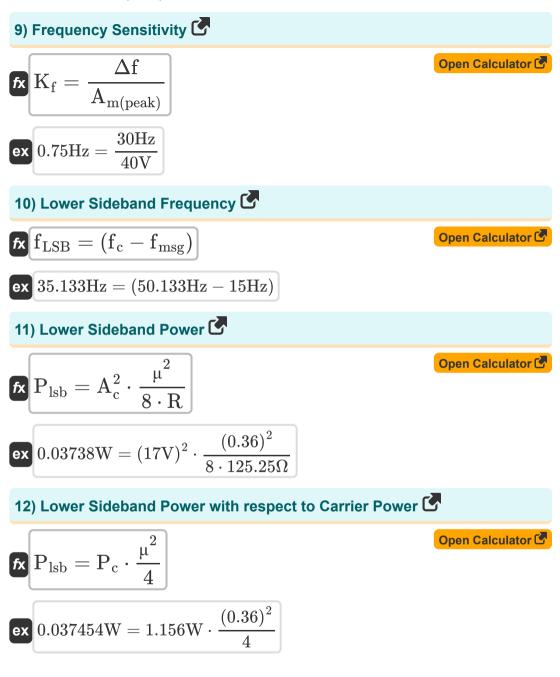
Sideband and Frequency Modulation C







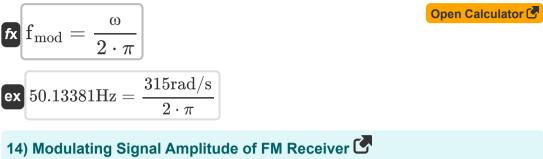












fx
$$A_m = \frac{\Delta P}{K_p \cdot F_m}$$

ex $6.120062V = \frac{912.0}{3.3 \cdot 45.157Hz}$

15) Modulating Signal Frequency of FM Receiver 🖸

fx
$$F_m = \frac{\Delta P}{K_p \cdot A_m}$$

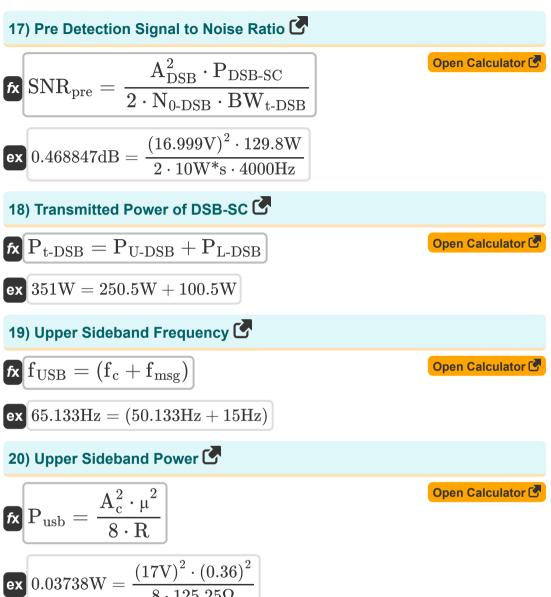
ex $45.15746 Hz = \frac{912.0}{3.3 \cdot 6.12 V}$

16) Modulation Index of FM Wave













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21) Upper Sideband Power with respect to Carrier Power

fx
$$P_{usb} = P_c \cdot \frac{\mu^2}{4}$$

ex $0.037454W = 1.156W \cdot \frac{(0.36)^2}{4}$





Variables Used

- **A**_c Amplitude of Carrier Signal (Volt)
- ADSB Amplitude of Carrier Signal DSB-SC (Volt)
- Am Amplitude of Modulating Signal (Volt)
- Am(peak) Peak Amplitude of Message (Volt)
- BW_{DSB} Bandwidth in DSB-SC (Hertz)
- BW_{FM} Bandwidth of FM Wave (Hertz)
- BW_{t-DSB} Transmission Bandwidth DSBSC (Hertz)
- BW_{VSB} Bandwidth of VSB (Hertz)
- **f_c** Carrier Frequency (*Hertz*)
- **f_{cs}** Carrier Swing (*Hertz*)
- **f_{LSB}** Lower Sideband Frequency (*Hertz*)
- **F**_m Modulating Signal Frequency (Hertz)
- **f**m-DSB Maximum Frequency DSB-SC (Hertz)
- **f**mod Modulating Frequency (Hertz)
- **f_{msq}** Message Maximum Frequency (*Hertz*)
- **f_{USB}** Upper Sideband Frequency (Hertz)
- **f_{v-DSB}** Vestige Frequency (Hertz)
- K_f Frequency Sensitivity (Hertz)
- Kp Proportionality Constant
- N_{0-DSB} Noise Density DSB-SC (Watt-Second)



- Pc Carrier Power (Watt)
- PDSB-SC Total Power DSB-SC (Watt)
- PL-DSB Lower Sideband Power DSB-SC (Watt)
- PISb Lower Sideband Power (Watt)
- Pt-DSB Transmitted Power of DSB-SC (Watt)
- PU-DSB Upper Sideband Power in DSB-SC (Watt)
- Pusb Upper Sideband Power (Watt)
- **R** Resistance (Ohm)
- SNRpre Pre Detection SNR of DSB-SC (Decibel)
- β Modulation Index in FM
- Δf Frequency Deviation (Hertz)
- ΔP Phase Deviation
- µ Modulation Index
- **ω** Angular Frequency (Radian per Second)



Constants, Functions, Measurements used

- Constant: pi, 3.14159265358979323846264338327950288 Archimedes' constant
- Measurement: Energy in Watt-Second (W*s)
 Energy Unit Conversion
- Measurement: Power in Watt (W) Power Unit Conversion
- Measurement: Noise in Decibel (dB) Noise Unit Conversion
- Measurement: Frequency in Hertz (Hz) Frequency Unit Conversion
- Measurement: Electric Resistance in Ohm (Ω)
 Electric Resistance Unit Conversion
- Measurement: Electric Potential in Volt (V)
 Electric Potential Unit Conversion
- Measurement: Angular Frequency in Radian per Second (rad/s) Angular Frequency Unit Conversion





Check other formula lists

- Amplitude Modulation
 Characteristics Formulas
- Analog Noise and Power Analysis
 Sideband and Frequency Formulas
 Modulation Formulas
- Frequency Modulation
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- Fundamentals of Analog Communications Formulas
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